Space Weather Forecast

Issued on Saturday, 04 February 2023 at 01:04 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight chance of Moderate solar activity throughout. Slight chance of G1/Minor Storm, early on Day 1, but mainly Days 2-4 (05-07 Feb).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity has been Low, with occasional minor Common-class flares in the past 24 hours. There are currently seven sunspot regions on the visible disc. All of which are small and relatively simple, although some minor development has been observed. No Earth-directed Coronal Mass Ejections (CMEs) have been observed in available imagery.

Solar Wind / Geomagnetic Activity: Solar wind parameters supported the arrival of a weak CME at 03/1050 UTC. Wind speeds are currently around 340 km/s and have remained Slow throughout, with a peak of around 375 km/s. The total Interplanetary Magnetic Field strength was weak, before jumping to moderate as the CME arrived. It has since returned to being weak. The important north-south component varying weakly. Geomagnetic activity was largely Quiet (Kp 0-2), with a couple of Unsettled (Kp 3) periods.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low activity is forecast with the sunspots on the visible disc currently small and relatively simple. There is a slight chance of isolated Moderate class flares. New sunspots are forecast to rotate onto the disc during the period.

Solar Wind / Geomagnetic Activity: A weak CME arrived at Earth on 03 Feb (attributed to a CME released on 30 Jan). Minor effects from this are likely to continue through Day 1, gradually waning. Wind speeds are currently Slow and are expected to remain so through much of Day 1 (04 Feb). Fast winds from a coronal hole are forecast to arrive during the period, strengthening winds to Elevated levels. Although there is uncertainty in the arrival time of this fast wind, the most likely arrival is during Day 2 (05 Feb).

Geomagnetic activity is expected to be mainly Quiet to Unsettled throughout. There is a chance of Active intervals and a slight chance of a G1/Minor Storm interval, early on Day 1 associated with waning effects of the current weak CME, but most likely through Days 2-4 (05-07 Feb) as the anticipated fast winds associated with a coronal hole arrive.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to be at background levels with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	20	20	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	10	10	10	10
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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